CLINICAL STUDY OF THE LENS INDUCED GLAUCOMA AND ITS VISUAL PROGNOSIS

THESIS

FOR

MASTER OF SURGERY

(OPHTHALMOLOGY)

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1990 RAMESH CHANDRA AGARWAL

C E R T I F I C A T E

Certified that the research work entitled "Clinical study of lens induced glaucoma and its visual prognosis" which is being submitted as thesis for M.S. (Ophthalmology) examination of Bundelkhand University, 1990 by Dr. Ramesh Chandra Agarwal has been carried out in the department of Ophthalmology, M.L.B. Medical College, Jhansi.

He has put in the necessary stay in this department as per University regulations.

Dated: September, 10, 1989.

(G.D. GUPTA)
M.S., D.O.M.S.,
Reader and Head,
Department of Ophthalmology,
M.L.B. Medical College, Jhansi.

C E R T I F I C A T E

Certified that the work entitled "Clinical study of lens induced glaucoma and its visual prognosis" was conducted by Dr. Ramesh Chandra Agarwal under our direct guidance and supervision. The investigations, techn ique and statistics mentioned in the thesis were actually undertaken by candidate himself. His observations have been checked by us regularly.

(B.S. JAIN)
M.S.,
Lecturer,
Department of Ophthalmology,
M.L.B.Medical College, Jhansi
(U.P.)
(GUIDE)

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(G.D. GUPTA)
M.S., D.O.M.S.,
Reader and Head,
Department of Ophthalmology,
M.L.B. Medical College, Jhansi.
(CO-GUIDE)

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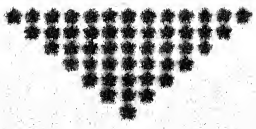
R. Agarwal

(RAMESH CHANDRA AGARWAL)

C O N T E N T S



INTRODUCTION

INTRODUCTION

Lens induced glaucoma is a glaucoma which developed secondary to the change in morphology or pathology of the lens.

It may be safely said that while everyone would develop a senile cataract, if he lived long enough: So also would everyone would obtain a spontaneous cure, if life was sufficiently prolonged.

In India each year about 12 million persons become temporarely blind due to the maturation of cataract out of which several persons become permanent blind due to the unavailability of the treatment and hyper - maturation. Because 65% Indian population live in the villages are illiterate, poor and ignorant, does not know the consiquences of hypermaturation of cataract and they may develop lens induced glaucoma as the curse for their illiteracy, poverty and ignorance. This condition was present since time immorial but does not come into light due to lack of literature and diagnostic tools. In the last two decades of 19th century some scientist observed the frequent occurance of iritis and rise in the intraocular pressure during

spontaneous cure of senile cataract, suggest some relationship between the spotaneous obsorption of lens and development of lens induced glaucoma.

Szily (1864) first time observed the occurance of glaucoma in case of long standing mature cataract. Reuss also found that glaucoma occur in 8 and iridocyctitis in 3 cases of spontaneous cure of senile cataract. Gifford (1900) describe the lens induced glaucoma is a glaucoma associated with hypermature cataract and urged its prevention by cataract extraction. Further Verhoeff et al (1922), Knapp (1937), Kaufman (1933), Heath (1941), Courtney (1942), Sugar (1949), Irvine & Irvine (1952), Mubersty and Gourlay (1953) and recently Sallen and Hughes (1955) have reported on their experience with this entity and have discussed its prevention and appropriate therapy.

Heath (1941) described that increased intraocular pressure is anticipated with the rupture of the lens capsule and lens matter streaming into the anterior chamber or if the lens luxated into anterior chamber with the capsule intact. Glaucoma of this type which usually has a violent onset with the characteristic pathologic

picture, liquification of the lens cortex open iridocorneal angle and presence of large histiocytes which have engulfed liquified lens material and are obstructing the trabecular meshwork. These features were first described by Zeeman, who named the condition phacogenetic glaucoma. Subsequently various workers described such type of cases under different names like lens induced glaucoma, lens induced uveitis and glaucoma, phacotoxic, phacogenic and finally phacolytic glaucoma have been replaced by term lens induced glaucoma, at present the lens induced glaucoma have a clearcut clinical picture characterised by - (i) a violent secondary glaucoma in one eye with the senile mature cataract, hypermature senile cataract (rarely intumescent senile cataract). Yet with an open angle, (ii) Normal intraocular pressure and open angle in the other eye and (iii) a prompt relief of symptoms and restoration of vision, after cataract extraction in the affected eye.

Lens induced glaucoma was classified as -

(A) Lens induced secondary open angle glaucoma (phacogenic) -

(a) Phacolytic glaucoma,

(b) Phacoanaphylectic glaucoma and uveitis.

(B) Lens induced secondary angle closure glaucoma.

(a) Due to intumescence of lens,

(b) Due to subluxation or dislocation of lens,

(c) Due to spherophakia, Microphakia.

Lens induced glaucoma likely to be encountered more frequently in the areas where hypermaturity of the lens seen more often. Illiteracy and poverty increases much more incidence of this glaucoma. This preventable and curable condition though rare in developed countries, is unfortunately still prevelent in our country. The main aim of this study is to evaluate the incidence clinical features, management and visual prognosis of lens induced glaucoma.

REVIEW OF LITERATURE

REVIEW OF LITERATURE

History :

Glaucoma and cataract have affected the mankind eversince his emergence on the face of the earth, but their true nature was not recognized by ancient Greeks and Romans. The present form of condition has evaluete only through the age of the research. The word Glaucoma first appear in hippocrates (420 B.C.) togather with the amblyopia in the list of diseases affecting old people. Glaucoma is an ancient Greeks name meaning glare such as silverness of the sky as dull sheen of an eye which has lost its brightness.

Sams ad din (1806) described the glaucoma as a migrain of the eye. An illness associated with pain in the eye, hemicrania, dullness of the humour followed by dilatation of the pupil.

Cataract is also a senile problem. It may be safely said that while everyone would develop a senile cataract. If he lived long enough; so also would everyone obtain a spontaneous cure if life where sufficiently prolonged. Some time this spontaneous cure complicated by rupture of the lens capsule leads to rise in intra - ocular pressure.

When the intraocular pressure rises secondary to change in the morphology or pathology of the lens termed as lens induced glaucoma.

Sisly (1884) first noted the frequency with which the spontaneous cure of senile cataract is complicated by glaucoma. Reuss (1900) found that out of 34 cases of spontaneous cure of senile cataract glaucoma developed in eight and iritis or iridocylitis in three cases. Gifford (1900) observed that 3 out of four cases had lost their vision due to glaucoma during spontaneous cures of senile cataract. Instances of this condition are cited also by Rollet and Genet (1913), Gonzalis (1919), Daily (1933), Knapp (1937), Sox and Ehrlich (1941 - 1946), Sugar (1949) and Scott (1953). Safar (1928) and Kaufman (1933) mentioned that in such cases cholesterol crystals were seen in the anterior chamber.

Smith (1891) observed that obstruction to the outflow of aqueous occur at the pupil or at the drainage angle and in many cases at both site resulting in secondary glaucoma. Erich Seidel (1920) and later on Curran (1920) advocated the idea of blockage of pupil as the cause of glaucoma. Heath (1941) said that

rise in intraocular pressure is anticipated with the rupture of the capsule and lens matter streaming into anterior chamber with the capsule intact. The lens mater in the vitreous is a well known cause of recurring iridocyclitis and associated glaucoma.

Finally Barkan (1938) with the help of improved gonioscope devided the condition into closed angle type and open angle type.

Classification :

Lens induced glaucoma classified as :

1. Secondary open angle lens induced glaucoma. It include phacolytic glaucoma and phacoanaphyletic glaucoma.

2. Secondary closed angle lens induced glaucoma, include -

a). Phacomorphic glaucoma in which shape of the lens changed due to swollen cataractous lens (intumescent stage) or it may be secondary to trauma.

b). It may be associated with the dislocation of lens may be either spontaneous or traumatic, spontaneous dislocation are seen in patient with the condition such as marfan's syndrome.

homocystinuria and syphilis. subluxation is partial or complete. In trauma the lens may be partial or completely anteriorly or posteriorly dislocated.

c) Third type is glaucoma seen in the eye with spherophakia, which occur most commonly as a part of marchesani syndrome.

Pathophysiology :

Knapp (1937) suggested that irritation of the ciliary body by the bouncing lens nucleus of a margagnian cataract account for the many cases of phacogenic glaucoma. According to Meeth (1941) the lens is capable of causing glaucoma through a number of routes and also that the lens structure has within itself the material to produce glaucoma directly and or indirectly. Once out of its bed, the lens become a marauder and is in effect, a foreign body within the eye.

Sugar (1949) observed that glaucoma developed in cases of spontaneous rupture of lens capsule is due to lens protein which act in three ways -

1. Chemical irritation due to toxic by - products of lens hydrolysis.

2. Increases protein content of the aqueous which tend to lessen the osmotic differential between the aqueous and the blood serum.

3. Mechanical obstruction of the trabecular spaces by lens particles affecting the aqueous out flow.

Phacolytic glaucoma -

Flock et al (1955) studied the pathophysiology of 138 cases and observed that lenticular degeneration is essential for the development of this type of glaucoma. liquification of the cortex may occur focally or extensive and in 62% cases the entire cortex was envelved. Degenerative changes were usually observed in the lens epithelum and capsule. Most advanced alteration were observed posteriorly where often the capsule was attenuated markedly. In others the liquified lens corticalmaterial had apparently escaped through the unruptured capsule and could be seen over the surface of the lens and in the anterior chamber. Liquification of the lens cortex a process which may be called phacolysis is termed by Krause to be mediated by two

enzymes - protease 'A' and protease 'B'. Through their activity, large molecules of lens protein are disinte - grated to small molecules, which apparently diffuse through intact though perhapes more permeable lens capsule. The presence of lysed cortical material in the posterior and anterior chamber evokes a histiocytic response. Large mononuclear phagocytes collect over the lens surface. These macrophages have a very characteristic appearance once they have become engorged with liquified lens substance, they swell up and become rounded. Their cytoplasm is distended with the finally granular, pale staining, slightly acidophilic particles of the lens material, almost identical with that still remaining within the lens. These macrophages carried by aqueous flow and become relatively more concentrated in the irido corneal angle. The intertrabecular spaces and the surface of the trabecula become filled with these cells and with free lens material present in the aqueous. These macrophages do not agglutinate or form keratic - precipitate.

Flock et al (1955) found typical pathological picture in 108 (78%) cases had hypermature cataract, liquified lens substance in the posterior and anterior chamber and characteristic histiocytic response.

Irvine et al (1952) also supported the same view about the pathology of phacolytic glaucoma.

Turbid aqueous may shows a cloud of punctate irridiscent opacities, they are mononuclear macrophages swollen with the lens protein granule. Goldberg (1967) aspirate the aqueous from anterior chamber through a miliporefilter and demonstrate the highly characteristic phacolytic macrophages.

Phacoanaphylactic glaucoma :

Verhoeff and Lemoine (1922) described that lens protein senstise the eye, producing usually a severe and some time milder inflammation characterised by invasion of the lens by polymorphonuclear leucocytes and mononuclear phegocytes. The presence of giant cells about the lens fragments in the iris and in the pupillary membrane which often formed. Deposition of conglomerate precipitate on the descemets membrane. The presence of cyclitic membrane in the protracted cases. The lens fragements in the vitreous causes a collection of pus cells in the vitreous as well as on the retina, similar to the keratic precipitate. The pathognomic finding is the combination of polymorphonuclear leucocyte, macro - pheges and phagocytized lens material.

Wood & Berky stated that lens substance is a weak antigen. There is evidence that certain reaction have an allergic aspect Verhoeff and Lemoine, Burky, Burky and Benten, Irvine and Irvine (1952) described that in cases with the hypermature cataract the lens substance escaping into the eye cavities produces uveitis and glaucoma, pathologically there is marked plasma cell reaction in the iris. If lens material is exuded posteriorly a marked cyclitis with plasma cells and mononuclear phagocytic cells response clouding the vitreous, and deposition of clumps of cells on the retina and on the descemet's membrane.

Phacomarphic glaucoma :

(Intumescence of the lens) Von Graefe (1869) recognised that rapid swelling of the lens frequently excites a secondary rise in the intraocular pressure. This may occur in two conditions, one is with the rapidly developing intumescent cataract of senile type and other is traumatic cataract caused either by perforating injury or by an operation of discision. The swollen lens pushes the iris forword making the anterior chamber sufficiently shallow to blocks its angle or to permit other factors such as mydriasis to do so.priestley-

Smith (1979), Remitz (1956) observed that it should be resemble as the primary angle closure glaucoma. There are three differences - (i) the fellow eye in the phacomorphic glaucoma frequently has an anterior chamber of normal depth, (ii) the antecedent refractive error may be of any type in phacomorphic glaucoma while in primary angle closure glaucoma hyperopia is common and (iii) the mature cataract in the phacomorphic glaucoma reduces the severety of visual symptoms.

Displacement of the lens :

A subluxation or luxation of lens wheather it be spontaneous or traumatic is frequently followed by development of secondary glaucoma. Brown (1865) found that glaucoma is not uncommonly associated with congenital subluxation as an isolated finding or as part of marfan's syndrome, marchesani syndrome or less commonly in homocystinuria.

In traumatic cases secondary glaucoma is more common 36 out of 70 cases, Wegner (1915); 15 out of 38 cases, M. Mc Donald and Puvnell (1957) and 6 out of 11 cases Calhaun and Wagler (1960. In anterior dislocation of lens wheather spontaneous or traumatic an immediate secondary glaucoma is much more common.

Wegner (1915) studied that glaucoma occur in 14 out of 15 cases of anterior dislocation of lens into anterior chamber. Rodman (1963) found that 34 out of 44 cases of traumatic anterior dislocation of the lens had a clinical history or pathological evidence of glaucoma. In traumatic anterior subluxation or dislocation of the lens secondary glaucoma occur due to the recession of the angle of anterior chamber, Rodman (1963), Pupillary block by vitreous or lens. Chandler (1964) has commented on the frequent occurance of glaucoma in ectopia lentis, marfan's syndrome, marchesani syndrome and homocystinuria. Smeral (1962) and Segal (1962) found that in ectopia lentis, marfan's syndrome and marchesani syndrome, secondary glaucoma occur due to envolvement of angle of anterior chamber.

In spantaneous anterior dislocation, the lens is some time incarcirated in the pupil resulting in the pupillary block glaucoma. If the lens is completely in the anterior chamber the pupil may be blocked by iris carrying forward against the posterior surface of the lens lead to formation of extrinsic anterior peripheral synechia which hinderd the aqueous flow, Rodman (1963), Chandler (1964).

Archnodactyly, cardiac anomalies, sub luxated lens, some time glaucoma characterize the marfan's syndrome. In 80% of the cases the lens is spherical in shape and dislocated upword. Microscopically the angle of such eye shows a thickend anomalous trabecular meshwork with a large number of trabecular sheets passing the scleral spur and inserting directly into the ciliary body. Increased intraocular pressure is produced by trabecular anomaly as well as dislocation of lens. Homocystinuria is associated with subluxated or dislocated lens was first described by Carson and Neill (1962) and well over 100 cases have since been reported.

In posterior dislocation of lens of traumatic origin secondary glaucoma is not so frequent, 2 out of 9 cases. Calhaun and Hagler (1960). Glaucoma occur as a result of trauma not due to dislocation of lens Redman (1963), Chandler (1964). In spotaneous posterior dislocation, the lens usually well tolerated by eye. In those cases where hypertension occur, it is due to the vitreopupillary block, rubeosis secondary to retinal detachment, Redman (1963), Phecoanaphylectic or phacolytic glaucoma, Chandler (1959) or coincident primary glaucoma.

In traumatic posterior subluxation or dislocation of lens glaucoma occur due to the recession of the angle of anterior chamber (30 out of 31 cases) Redman (1963).

Microphakia or spherophakia is congenital and bilateral condition associated with skeletal changes may be complicated by glaucoma. Bowman (1865). Marchesani (1939) described a syndrome characterised by spherophakia and ectopia lentis giving rise to lenticular myopia and iridodonesis and glaucoma which is probably due to spherophakia. Spherical lens blocking the pupil leads to pupillary block glaucoma. Repeated self limitingattacks of glaucoma may ultimately result in the formation of extensive peripheral anterior synechia and permanent increase in the intraocular pressure. Gartner (1958). Zoldin (1959). Levy and Adreson (1961).

Incidence :

The incidence of phacogenic glaucoma amongs the various types of secondary glaucoma was studied by different workers as follows :

Table - 1

Shows incidence of phacogenic glaucoma in relation to secondary glaucoma

Sl. No.	Scientist	Total no. of case studied	No. of case of lens induced glaucoma	Percentage
1.	Lehrfeld and Reber (1937)	413	80	19.4
2.	Kurland and Taub (1957)	14	-	-
3.	Ymazi et al (1977)	761	38	5.0
4.	Agarwal H.C. et al (1982)	1065	131	12.4

Phacogenic glaucoma included, glaucoma due to the pupillary block associated with the intumescent or hypermature morgagnian cataract, phacolytic glaucoma, phacotoxic glaucoma and secondary glaucoma associated with displacement of the lens.

The incidence of lens induced glaucoma in relation to the total number of senile cataract operated was observed by various workers is given in table - 2.

Table - 2

Incidence of lens induced glaucoma in relation to total no. of senile cataract operated

Study	Total no. of cataract operated	No. of case of lens induced glaucoma	Percentage
Jain, I.S. et al (1982)	2719	108	3.91
Dhar G.L. et al (1984)	6294	214	3.40

The incidence of sex observed by various workers is given in table - 3.

Table - 3

Relationship of age & sex incidence

Sl. No.	Scientist	Average age (years)	Total no. of case studied	No.(%) of male	No.(%) of female
1.	Flock et al (1955)	70	138	82 (59.43%)	56 (40.57%)
2.	Jain I.S. et al (1982)	62	86	40 (46.57%)	46 (53.49%)
3.	Dhar G.L. et al (1984)	65.5	214	93 (43.46%)	121 (56.54%)

Flock et al (1955) observed that male sufrer 59.43% were dominating over females 40.57%. In further studies Jain et al (1982) and Dhar et al (1984) found that females are out numbered the males.

Clinical feature :

Lens induced glaucoma is characterised by the violent secondary glaucoma (resemble acute angle closure glaucoma) in the one eye with the senile mature cataract, hypermature senile cataract (rarely intumescent senile cataract) yet with an open angle. Normal intra-ocular pressure and open angle in the other eye and a prompt relief of symptoms and restoration of vision after cataract extraction in the affected eye.

Symptoms and signs :

All of the patient have seriously impared vision prior to the onset of acute glaucoma. The second group of symptoms are related to the onset of glaucoma, which in most cases was sudden and varried little from the well known picture of acute congestive glaucoma. Ocular and periorbital pain, headache of varrying severity, nausea, vomiting and prostration. The eye was usually congested and shows corneal oedema, aqueous flare, fixed often dilated pupil and shallow anterior chamber or

deeper anterior chamber, may be subluxation of lens, raised intraocular pressure and cataractous lens.

Hypermature cataract were seen in only 83 (39.0%) cases, mature intumescent cataract in 126 (58.5%) cases and immature cataract in 5 (2.5%) cases. Mean intrqocular pressure in the affected eye was 36.6 mm Hg ± 7.4 mm Hg. The highest recorded tension 60.3 mm Hg and lowest was 26.6 mm Hg. schiots. The other eye invarriably was quite with aphakia in 96 cases, immature cataract in 64 cases mature senile cataract in 38 cases and hypermature senile cataract in 16 cases.

Socio - economic status :

Srivastava, R.N. devided the persons socio - economically on account of percapita income. Person having per capita income Rs. 300 - 600 or above categorized into upper class Rs. 139 - 299 in middle class and bellow Rs. 139 in lower class.

Management :

According to Dhar et al (1984) first of all intra-ocular pressure should be controlled by acetazolamide osmotic agent like oral glycerol, 20% mannital (i/v) and timolol eye drop in different combination alongwith

local antibiotic drop. Surgical treatment was carried out as quickly as possible after an initial medical therapy. Cataract extraction was performed in single stage alongwith the peripheral iridectomy or other filtering operation. Heath (1941), Sugar (1944), Jain et al (1982), Dhar et al (1984).

Drug review :

Different drugs used to reduce the intraocular pressure.

Acetazolamide :

It is a carbonic anhydrase inhibitor. It reduces the production of aqueous by about 50% (Becker and May (1958); Draeger et al (1963)). It is given orally in the dose of 125 - 500 mg. one to four times a day and after single dose its action is apparant in 60 - 90 minute, reach a maximum in 3 - 5 hours and weareff in about 12 hours. Sustained action capsule of the drug have a more prolong effect did not be given more than twice a day (Stepanic, 1967).

Osmotic agent :

These substences raised the osmolarity of the plasma so that fluid withdrawn from the eye resulting in fall or intraocular pressure. Movement of the ocular fluid is established when there is defenitive concentration gradient, Galin et al (1959).

- Various indications for uses of osmotic agent
- Angle closure glaucoma
- Secondary glaucoma (Hypermature, phacolytic glaucoma.
- Preoperative

Urea :

First used osmotic agent Adler (1933), it induces marked hypotomy Aizawa (1962).

Mannitol :

According to Galin et al (1963), it has less side effect than urea. More potent hypotensive agent than urea Seeger and Lewis (1964), it is used intravenously.

Different osmotic agent used are given in table with their route of administration and doses.

Table-4

Shows different osmotic agent with their route of administration and dose

Name	Route of administration	Dose
Glycerol	Oral	1-1.5gm. 1 kg.
Ethylalcohol	Oral	0.1-1.5gm. kg.
Isosorbide	Oral	1gm. kg.

Side effects :

Dehydration of body cause, headache, pain in the back, mental confusion, disorientation, Tarter and Linn (1961), Becker (1967).

Diuresis is enhanced markedly with mannitol and they must be used with caution in patient with the cardiac, renal and hepatic diseases.

Betablockers :

As early as 1967 Philips, C.I., Howitt, G. and Rowland, D.J. introduced propranolol into glaucoma therapy. However because of its mild anesthetic properties, have made many investigators reluctant to use it as a topical medication for glaucoma.

Hall et al (1970) describe a new beta adrenergic blocking agent timolol. It blocks both beta $_1$ and beta$_2$ receptors. Timolol has neither sympathomimetic effect nor anaesthetic properties Fitz Gerald J.D. (1971). The abscence of local anaesthetic activity appears to make timolol a more reasonable choice for local use in long term therapy. In animal experiments, Hall R.A. etal (1970), Scriabine A. (1973), it is proved that it has 5 - 6 time greater activity than propranolol. It is levo isomer which is usually employed. Kat's and his associates (1976) reported single eye drop study uses 0.5% and 1% and 1.5% timolol opthalmic solution in 15 normal volunteers.

Intraocular pressure were decreased significantly in comparision to 15 control. No side effect were observed, in particular, there was no ocular irritation, no alteration in the pupillary size and no change in the visual acuity. Zemmerman and Kaufman (1977) conducted a single eye drop study on 30 patients with glaucoma and found significant lowering of intraocular pressure with timolol drops. A 50% reduction in the intraocular pressure was estimated when pressure reading at seven hours after the eye drops were compared with the pre-treatment level.

They also conducted a dose response analysis to a single eye drop in 20 glaucoma patients. They concluded that maximum effect was achieved by a concentration of 0.5%. They also noted a prolong duration of action still present atleast 24 hours after the eye drops. Timolol was used and found to be much effective as compared to pilocarpine. The result of William F., Roger et al (1978) also confirmed these findings.

Treatment of phacolytic glaucoma :

First of all lower the intraocular pressure by giving carbonic anhydrase inhibitor and osmotic agent then performed surgery. Robert H. et al (1964) studied that this glaucoma is misdiagnosed as angle closure glaucoma and iridectomy was performed. Flock's and co-workers pointed out that sudden onset and symptamology are often very similar to those of acute angle closure glaucoma. This probably was the reason for iridectomy in these cases. During operation ciliary body was torn and there was haemorrahage into anterior and posterior chamber. Infact red blood cells as well as the product of breakdown erythrocytes acting in the concert with macrophages attached by the escaped lens material, produced further mechanical blockage and aggravate the glaucoma.

Irvine and Irvine (1952) suggested that curability of this condition by removal of the lens. Flock and co-workers (1955) stated that after delivery of the lens the anterior chamber should be irrigated in an effort to remove as much as morgagnian fluid and as many macrophages as possible. Ahar (1984) in his study of 214 cases initially controlled the intraocular pressure by 20% mannitol and glycerol (orally). Diamox and or timolol in different combination with the local antibiotic drop. After that performed surgical procedure, cataract extraction alongwith the peripheral irridectomy (single stage) operation in 210 cases and in 4 cases surgery was carried out in two stage a preliminary peripheral irridectomy followed 2 weeks after cataract extraction.

Phaco anaphylactic glaucoma :

In this case corticosteroid therapy is usually minimally effective. Cure of the condition depends on recognition and extraction of all lens material

Intumescence of the lens :

In this intraocular pressure reduced by medical means such as carbonic anhydrase inhibitor. Osmotic agent and when tension was reduced to normal level lens is removed by extraction (in intrumescent stage) or curettee evacuation or aspiration (in traumatic cataract).

Jain I.S. et al managed 86 eyes of this type of glaucoma. He controlled the intraocular pressure by medical means and then intracapsular cataract extraction was done in 49 (57%) eyes. Planned extracapsular cataract extraction in 9 eyes and combined extraction with trabeculectomy in 9 eyes.

Dislocation of lens :

In spontaneous subluxation or luxation, treatment of choice is extraction of the lens. In homocystinuria an anteriorly dislocated lens producing an acute glaucoma. The dilemma is whether to extract the lens or to coax it back through the pupil in the hope that subsiquent miosis will prevent recurrent dislocation.

Clarke (1939) argued that in anteriorly dislocated lens, the lens extraction was justified. Chace (1945) reported the result of operating upon four cases of congenital bilateral subluxation of lens but concluded that the result in all cases were unsatisfactory. Chandler (1964) deplored the practice of extracting the dislocated lens and advocated for a peripheral irridectomy to eliminate the pupillary block in forward movement of the lens. Speath and Barber (1965), Thomas, Hollowell Peter, Cargell and Lester (1966) and Gardon, Carsten Hart and Pollitt (1978) reported the extracting anteriorly dislocated lens in patient with the homocystinuria vitreous was invarriably lost. Johnston (1968) described the removal of 6 lenses from the patient with the homocystinuria.

Rahman (1971) remove the lens in patient of secondary glaucoma due to anterior dislocation of lens. Elkington (1973) in his study gave opanion that an anteriorly dislocated lens in a patient with the homocystinuria should be managed medically, when ever possible. If the lens can not be replaced behind the iris by medical means, it should be reposited under general anaesthesia and peripheral irridectomy performed. In a child or young

audult would it appear reasonable to extract the lens. In traumatic dislocation the probability that the lens will rapidly become catractous and required extraction.

Spherophakia :

For this type of glaucoma the treatment is difficult. The condition usually paradoxical in that the use of miotics may lead to the rise in the tension (inverse glaucoma), Urbanick (1930), Robert (1953), which can be reversed by mydriatics. Extraction of the lens generally by means of vectis has frequently been advocated but has not always lead to relief. Needling of a spherophakic lens does not lead to absorption. Jack Levy and Anderson (1961) studied and found that irridectomy, Abexter no performed at an early stage in the filteration angle is appear to be simple and good procedure. Support of this view by Rosenthol and Kloepfer (1956). Once the angle of anterior chamber closed some form of drainage operation is necessary (iridenclesis or cyclodialysis).

The complication noted by Dhar G.L. et al (1984) are - Corneal hase, Hyphema (Post operative), Shallow anterior chamber, Rupture of the lens capsule, Vitreous prolapse and Hazy media.

Visual prognosis :

Jain I.S. et al (1982) observed that eyes tend to with stand raised intraocular pressure for a longer period than expected and observed that visual prognosis in the lens induced glaucoma depend upon the time interval between the onset of acute attack and starting of treatment and found the visual prognosis as following.

Dhar G.L. et al (1984) in his study observed the visual prognosis as follows :

Table - 5

Showing the visual acuity among the operated cases of lens induced glaucoma

Sl. No.	Scientist	6/18 or more		6/24 or less		NS PL	
		No.	%	No	%	No.	%
1.	Jain I.S. et al (1982) (86 cases)	54	(62.8%)	20	(23.3%)	12	(13.9%)
2.	Dhar G.L. et al (1984) (214 cases)	169	(79.0%)	36	(16.8%)	09	(04.2%)

MATERIAL AND METHOD

MATERIAL AND METHOD

The present study was carried out in the department of Ophthalmology, M.L.B. Medical College and Hospital, Jhansi between July, 1988 to June, 1989. The patients selected have marked visual deffect because of the advanced lenticular opacities and raised intraocular pressure. The patients suffering from lens induced glaucoma were taken up for the study.

The patients were of either sex and age ranged from 35 years to 80 years. Number of eyes underwent surgery was 36. The minimum follow up period was three month. The surgery was done by the consultant surgeon of the department.

The method :

The following pattern was addopted for almost all the patient :

History of present illness :

History of headache and eyeache, its severity, duration and association with vomiting, diminution of vision, redness and watering of eye. History of anti-glaucoma therapy was asked, if any.

Past History :

Regarding previous attack of some disease - trauma, vomiting, diabetes or visual disturbances, if any noted.

Personal History :

Symptoms relating to diabetes and hypertension were asked and addiction to any drug was recorded.

Examinations :

Systemic -

Recording of pulse, blood pressure, temperature examination of cardio - vascular and respiratory system.

Local -

The local examination was done under bright illumination with the help of uniocular corneal loppe (10 x) and + 13D condensing lens. By this we examine the conjunctiva, cornea, anterior chamber, iris pupil and lens.

The slit lamp examination was done routinely particularly to examine, transparency of cornea, aqueus flare, keratic precipitates, extent of the lenticular opacities and pigmentary desperson over lens to elicit pupillary reaction or perception of light in doubtful cases.

Investigations :

Routine -

It include urine albimin and sugar in all the cases and when ever indicated blood sugar, total leucocyte count, differential leucocyte count blood haemoglobin, erythrocyte sedimentation rate etc.

Special -

(1) Visual acuity - This was recorded in terms of snellen's test type, finger counting, hand movement, perception of light and projection of rays depending on the indevidualls visual status. The best corrected visual acuity was recorded in post operative and follow up period.

(2) Pupillary examination - Pupil of the both eyes were seen for -

- Pupillary reaction,
- Size of the pupil and
- Shape of the pupil.

Pupillary reaction-direct and consensual pupillary reaction were seen with the help of spot light.

Size and shape of the pupil were assessed with the help of torch.

(3) Tonometry - It was performed with the schiot'z tonometer with standard technique. Almost in all the cases, except in incooperative patient, where only digital tonometry was done, one particular schiot'z tonometer was used preoperatively post operatively and in follow up period.

- Patient was asked to lie down in supine position looking straight at the ceiling of the examination room.
- Xylocain 4% was instilled into the both eyes untill local anaesthesia was complete.
- Both eyes lids were separated with the finger without pressing on the eye ball and then the tonometer was placed vertically on the cornea so that it rest by its own weight.
- Depending on the tension of the eye there was a deflection of the recording needle on the scale.
- The reading on the scale was then translated from the conversion chart into milimeter of mercury.

PHOTOGRAPH SHOWING SCHIOTZ TONOMETRY (LEFT EYE)

(4) Fundoscopy - Both distant direct and direct ophthalmoscopy were done post operatively by Keeler's mediclux ophthalmoscope. The condition of the optic disc such as size, shape, colour, excavation nasal, shifting of vessels and disc cup ratio were noted. Beside this any abnormality in the fundus was recorded.

(5) Gonioscopy - It was done in co-operative patients by Goldman's three mirror Gonioscope to assess mainly the angle status (open or closed). Beside these the peripheral anterior synechia and neovascularisation of the angle, if any were noted.

When the desired investigations were done the patient was subjected for medical therapy followed by surgical intervention. Whenever the operation was delayed the patient was put on acetazolamide and timolol eye drop.

Preoperative preparation :

The patient were mentally prepared to undergo cataract extraction with sector iridectomy or combined surgery. To relieve the apprehension, anxiety and to have good sleep night before the operation diazepam 5mg tablet was given. The eye lashes were cut a day before.

The intraocular pressure was controlled with acetazolamide 250 mg tablet in suitable doses. Two ounces of glycerol with equal amount of water as a single dose therapy, when tension was not controlled, intravenous mannitol 20% was injected an hour before the operation. To premedicate the patient, injection pentazocine 30 mg and injection phenargan 50 mg were given intramuscularly half an hour before the operation.

Anaesthesia :

Topical - By instillation of 4% lignocain 4 - 5 times at 2 minute interval.

Regional akinesia - It was obtained by 2% lignocain with adrenalin by O'Brien's method preferably and when ever essential by vonlint's technique too.

Ciliary block - By 1 ml. retrobulbar injection of 2% lignocain with adrenalin followed by ocular massage for 3 - 4 minutes.

Steps of operation :

The operation was done under 3x magnifications by magnifying glasses. After the lid and superior rectus suturing, a limbal based conjunctival flaps was formed

over the superior 180 degree approximately 4 m.m. from limbus at 12 0'clock position and gradually tapperd down closed to the limbus at 3 and 9 0'clock position. Flape was reflected over the cornea and limbus cleared. The superfecial vessels were thermally cauterized.

Then with the help of blade enter the anterior chamber at 12 0'clock position. Corneal scissors was then introduced into the anterior chamber through already formed incision, to extend the corneal section passing through the preformed grooves. An iridectomy was performed after the completion of the section. After releasing the superior rectus muscle suture lens extraction was done by cryoprobe / forceps / vectis or as indicated otherwise. Intra capsular cataract extraction was planned in every case.

In some cases a whip like iris pillar reposited in the sub conjuctival space (iridenclesis) alongwith the cataract extraction. In some cases trabeculectomy alongwith the lens extraction was done.

Preplaced mattress suture were tied, iris was reposited and corneo scleral stiches were given with 8 - 0 virgin silk or 9 - 0 manofilament. Then conjunctival flaps were reposited and stiched continuously with 8 - 0 silk suture. The sterile air was injected to reform the anterior chamber. Sub-conjunctival injection of decadron 1 mg. and gentamicin 10 mg. was given. The operative complications were managed as in the routine cataract extraction. After applying the plain antibiotic eye ointment the eye was bandaged.

Post Operative management :

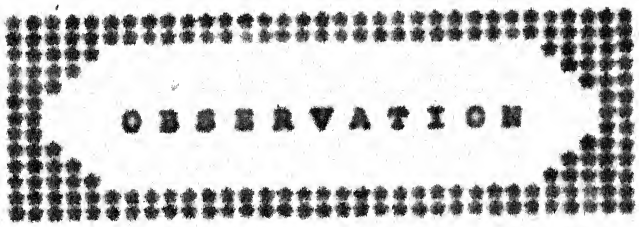
A suitable systemic antibiotic usually chloramphenicol 250 mg. 4 times a day or cotrimoxazole double strength 1 tablet twice a day with anti - inflamatory drug were given to all the patients, for 3 days atleast. Daily dressing was done with corticosteroid and antibiotic eye ointment. 1% atropine was added in the case of iritis or in whom sector iridectomy was performed. Injection gentamicin, decadron and atropine were given sub - conjunctively when indicated.

The eye was examined on every dressing and post-operative details were noted. Particular attention was paid to the condition of section wound, striate keratitis, depth of the anterior chamber hyphema and any sign of iritis and were managed accordingly. In uncomplicated cases the conjunctival and corneoscleral stiches were removed on the 8th day and the patient was discharged subsiquently with the follow up treatment and advise.

The follow up :

The patient were advised for follow up examination at 15 days after discharge then at one month duration. Aphakic correction was done at one and half month after the operation. Final examination was done at 3 months after operation.

At the follow up the eye was examined for any infection, transparency of cornea, depth of anterior chamber and condition of the iris. Fundoscopy was done to evaluate the condition of disc. More emphasis was given on corrected visual acuity and intraocular pressure. All the findings were recorded for the final assessment.


OBSERVATION

OBSERVATION

The present study of the lens induced glaucoma and its visual prognosis was carried out in the department of Ophthalmology, M.L.B. Medical College and Hospital, Jhansi. During this period 36 patients were studied out of which 7 patients were operated for glaucoma only on first stage. After that they were not turned up for 2nd stage operation, that is lens extraction. Twenty nine eyes were operated for both glaucoma and cataract and were followed up. The follow up of the patients varried between 15 days to 3 months. The average follow up being one and half month.

Incidence :

Thirty six cases of lens induced glaucoma were recorded over this period of study, contributing about 10.6% of the total 339 cases of senile cataract admitted for cataract extraction.

Age & sex incidence :

The age and sex of the patients are shown in table no. 1.

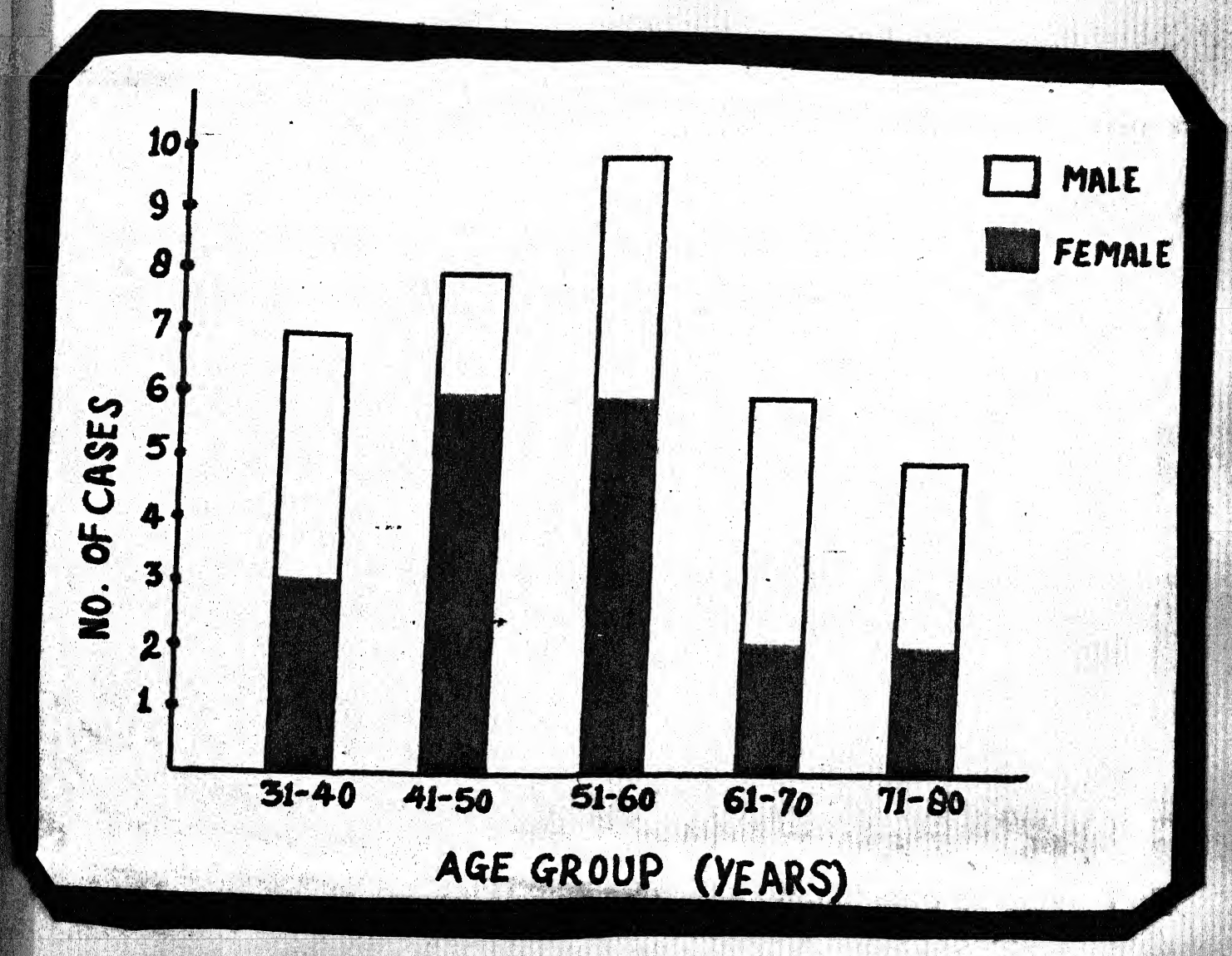
Table no. 1

(Distribution of age & sex of patients of lens induced glaucoma in 36 eyes)

Sl. No.	Age group (years)	No. of patients	%	Male patients	%	Female patients	%
1.	31 - 40	07	19.44	04	11.11	03	8.33
2.	41 - 50	08	22.22	02	5.55	06	16.66
3.	51 - 60	10	27.77	04	11.11	06	16.66
4.	61 - 70	06	16.66	04	11.11	02	5.55
5.	71 - 80	05	13.88	03	8.33	02	5.55
	Total	36	100.00	17	47.22	19	52.78

The age of the patients varied between 35 years to 80 years. The average age of the patient was 55.7 ± 12.46 years. Age group 31 - 40 includes 07 (19.44%) patients out of these 4 were males and 3 were females. Age group 41 - 50 years includes 8 (22.22%) patients, the number of males and females in this group was 2 and 6 respectively. The maximum number of patients recorded in the third group that is 6th decade were 10 (27.77%) out of which 4 males and 6 females.

The minimum number of 5 patients were in the age group of 71 - 80 years in which 3 males and 2 were females.



GRAPH SHOWING AGE & SEX DISTRIBUTION IN PRESENT STUDY

The total number of male patients were 17 (47.22%) while female 19 (52.78%).

Table No. 2

(Duration of acute attack in lens induced glaucoma in 29 eyes, operated for both cataract & glaucoma)

Sl. No.	Duration of acute attack (days)	No. of eyes	Percentage
Group (A)			
1.	∠ 2	5	17.24
2.	3 - 5	7	24.13
Group (B)			
1.	6 - 10	6	20.68
2.	11 - 20	4	13.79
3.	7 20	7	24.13

The patients were further devided into two groups, according to the duration of onset of disease. Group 'A' included patients of 1 to 5 days of duration of onset of acute attack and Group 'B' included patients of duration of illness of 6 days onwards.

The former group include 12 (41.37%) out of 29 cases while the later group included 17 (58.62%) patients. This was done for statistical evaluation of results in two group to know the effect of duration of illness.

In all the duration of acute attack varried between 1 to 60 days. 5 (17.24%) eyes presented with acute attack within 2 days, 7 (24.13%) eyes between 3 - 5 days, 6 (20.68%) eyes between 6 - 10 days, 4 (13.79%) between 11 - 20 days and 7 (24.13%) eyes presented with the acute attack more than 20 days. In group 'A' 12(41.37%) eyes present with the acute attack upto 5 days while rest 17 (58.60%) eyes had history of attack more than 6 days.

As for as the side of eyes was concerned 15 (41.66%) were left while rest 21 (58.33%) were right.

We further devided the patient came from Urban or Rural area. The number of patients came from Urban area were 12 (33.33%), while from Rural area were 24 (66.66%).

Table no. 3

(Shows the number of cases belong to different socio-economic class)

Sl. No.	Socio-economic class	Per capita income (Rs.)	No. of cases	Percentage
1.	Upper class	600 or above	0	0
2.	Upper middle class	300 - 599	0	0
3.	Middle class	140 - 299	02	5.55%
4.	Lower middle class	60 - 139	10	27.77%
5.	Lower class	less than 60	24	66.66%

We also devide the patient according to their socio - economic status. There was no patient from upper & upper middle class. Only 02 (5.55%) patients belong to middle class and 10 (27.77%) patients were from lower middle class and 24 (66.66%) were from lower class.

Presentation of symptoms :

The patients presented with gross visual deficit because of the advanced lenticular opacity and glaucoma.

The patients with the lens induced glaucoma presented with the gradual diminution of vision super imposed with moderate to severe headache and sudden to acute onset of pain.

The most symptoms were of acute onset except the diminution of vision, which patients had for month and years. The symptoms complained by the patients in order of frequency are recorded in table no. 4.

Table no. 4

(The different symptoms in lens induced glaucoma in order of frequency in 36 cases)

Sl. No.	Symptom	No. of patients	percentage
1.	Diminution of vision	36	100.00
2.	Eye pain	36	100.00
3.	Redness	36	100.00
4.	Headache	31	82.20
5.	Nausea vomiting	14	38.88
6.	Swelling of the lid	07	19.44
7.	Watering of eye	07	19.44

Diminution of vision, eye pain and redness of eye presented in all the cases of lens induced glauco 31 (82.20%) case had headache, 14 (38.88%) patient ha

nausea / vomiting at the time of onset of acute attack, only 7 (19.44%) patients had lid swelling and watering of eye.

Signs :

Examination of the cases of lens induced glaucoma revealed the following signs were given in table no. 5 in order of frequency.

Table no. 5

(Signs revealed in cases of lens induced glaucoma in order of frequency)

Sl. No.	Sign	No. of patient	Percentage
1.	Circum corneal congestion	36	100.00
2.	Dilated pupil	36	100.00
3.	Shallow anterior chamber	36	100.00
4.	Deffective vision - HM/PC - 01 PL/PR - 22 Only PL - 02 Doubtful PL - 11	36	100.00
5.	Raised intraocular pressure	35	97.22
6.	Senile cataract	31	86.11
7.	Hazy cornea	20	55.55
8.	Conjunctival congestion	20	55.55
9.	Lid Oedema	06	16.66
10.	Aqueous flare	05	13.89
11.	Traumatic cataract	05	13.89
12.	Open angle of anterior chamber (done in 6 cases)	06	100.00

PHOTOGRAPH OF A CASE OF LENS INDUCED SECONDARY GLAUCOMA (LEFT EYE)

The circum corneal congestion, dilated pupil, shallow anterior chamber and diffective vision found in all the cases. Raised intraocular pressure were observed in 35 (97.22%) eyes where as only one (2.78%) patient had low tension inspite of all other signs are present.

Only in 1 patient hand movement was present. In 22 patients PL/RR were present. 2 patients had only perception of light and 11 patients had doubtful PL.

On slit lamp examination observed that 5 patients had aqueous flare.

Gonioscopy was done in six patients and all were having open angle.

The signs of iritis were observed in patients were given in table no. 6.

Table no. 6

(Patients shows sign of iritis in 36 eyes)

Sl.No.	Sign	No.of case		Percentage	
1.	Iritis present				
	a) Synechia	6	11	16.76	30.55
	b) Aqueous flare	5		13.80	
2.	Iritis not present		25		69.44

Iritis was observed in 11 (30.55%) cases in which it was present in the acute form with synechia/ aqueous flare.

Type of lens induced glaucoma :

The various type of lens induced glaucoma in 36 eyes were shown in table no. 7. The diagnosis of different type of glaucoma was based on history clinical examination, slit lamp examination etc.

Break up of pre - operative diagnosis as related to type of glaucoma in 36 eyes.

Table no. 7

(Type of glaucoma in 36 eyes)

Sl.No.	Type of glaucoma	No.of cases	Percentage
1.	Phacotoxic	29	80.55
2.	Phacomorphic	04	11.11
3.	Traumatic (anterior dislocation)	03	08.33

The maximum number of patients that is 29 (80.55%) had phacotoxic lens induced glaucoma, 4 (11.11%) phacomorphic glaucoma and 3 (8.33%) traumatic lens induced glaucoma in which lens dislocated anteriorly.

PHOTOGRAPH OF A CASE OF LENS INDUCED GLAUCOMA DUE TO TRAUMATIC ANTERIOR DISLOCATION OF LENS (RIGHT EYE)

Type of cataract :

The different types of cataract found in cases of lens induced glaucoma are given in table no. 8.

Table no. 8

(Type of cataract in 36 eyes)

Type of cataract	No.of patient	Percentage
Immature cataract	1	2.77
Mature cataract	4	11.11
Mature cataract with swollen lens	3	8.33
Mature dislocated anterior	3	8.33
Hypermature cataract	25	69.83

Though the evaluation of cataract was done pre-operatively, its type and extent was further confirmed after the removal, under magnification.

The maximum number of cases found with hypermature cataract were 25 (69.83%) and minimum number was 1 (2.77%) with immature cataract. In 3 cases lens induced glaucoma was associated with mature anteriorly dislocated lens and in 3 cases (8.33%) associated with mature swollen lens blocking pupillary area.

Pre-operative visual acuity :

The pre-operative visual acuity was diminished due to lenticular opacity and corneal oedema. Pre-operative visual acuity observed in 29 cases were given in table no. 9.

Table no. 9

(Pre-operative visual acuity in 29 cases)

Visual acuity	No. of eyes	Percentage
Hand movement	1	3.44
PL PR	19	65.51
Only PL	2	6.89
Doubtful PL	7	24.13

Table no. 9 shows the pre-operative visual acuity of 29 cases with lens induced glaucoma, one (3.44%) eye had hand movements. only.The maximum number of 19 (65.51%) eyes had postive PL with PR in all the four quadrents. 2 (6.6.89%) had PL only and 7 (24.13%) eyes had doubtful PL.

Pre-Operative intraocular pressure :

The intraocular pressure at the time of admission (initial tension) is shown in table no. 10.

Table no. 10

(Pre-operative intraocular pressure in 29 eyes)

Sl. No.	Duration of acute attacks (day)	No.of eye	Average pre-operative intraocular pressure (mm / mg)
Group (A)			
1.	∠ 2	5	35.5
2.	3 - 5	7	46.0
Group (B)			
1.	6 - 10	6	32.66
2.	11 - 20	4	45.05
3.	7 20	7	50.67

Pre - operative average tension was recorded in Group (A) was 40.75 mm/mg and in Group (B) 42.79 mm/mg. The minimum intraocular pressure recorded was 24.4 mm/mg and maximum 69.3 mm/mg with average 41.97 mm/mg.

Other eye :

The other eye invarriably was quite with aphakia in 8 (22.22%) cases. Immature cataract in 20 (55.55%) cases, mature cataract in one (2.77%) and hyper mature absolute eye in 1 (2.77%) case. In 6 (16.66%) cases the other eye was quite normal.

Treatment :

Pre- operative antiglaucoma therapy - The antiglaucoma therapy was given to all the patients and is shown in table no. 11.

Table no. 11

(Pre-operative antiglaucoma therapy)

Medicine	No. of patient	Percentage
Acetazolamide	7	24.13
Acetazolamide + Pilocarpine	3	10.34
Acetazolamide + timolol	4	13.79
Acetazolamide + timolol + Glycerol	7	24.13
All above + mannitol	8	27.58

Acetazolamide was used in all the 29 patients. It alone controlled the tension in 7 (24.13%) eyes with mild rise of tension. More over these eyes were operated upon a day or two later.

The tension was controlled in further 4 (13.79%) eyes with timolol and acetazolamide. These two drugs in addition with glycerol further controlled the tension in 7 (24.13%) eyes.

Even with three drugs tension remained high in 8 (27.58%) eyes, so intravenous mannitol was given one hour before surgery.

Surgical treatment was done as quickly as possible after an initial medical treatment, cataract extraction was performed in single stage alongwith the sector iridectomy or iridencelesis in 28 (77.77%) cases. Only in one (2.77%) case surgery was carried out in two stage a preliminary iridenclesis followed 6 weeks, after by cataract extraction, in 7 (19.44%) eye iridenclesis was performed in Ist stage operation but they were not turned up for lens extraction.

Complications :

The various complications occur pre-operatively during operation and immediate after operations are recorded in table no. 12.

Table no. 12

(Complications following surgery in 29 eyes)

Sl. No.	Complication	No. of cases	Percentage
1.	Hyphaema	1	3.44
2.	Iris injury	1	3.44
3.	Vitreous prolapse	2	6.89
4.	Rupture of lens capsule	2	6.89
5.	Hazy media	1	3.44

Pre - operatively - There were no complications.

PHOTOGRAPH OF A CASE OF LENS INDUCED GLAUCOMA AFTER COMBINE OPERATION (RIGHT EYE)

Intra - operative complications :

The hyphaema was seen in 1 (3.44%) eye that was massive and lead to corneal staining.

Iris injury occured in 1 (3.44%) eye while vitreous prolapse occure in 2 (6.89%) eyes. Rupture of the lens capsule occured in two (6.89%) cases.

Immediate post-operative complications :

The complication occuring within 15 days of follow up period were considered immediate or early post-operative complication.

The Striate Keratitis was observed in 19 (65.51%) cases. It cleared in all the cases by the end of 15 days of follow up.

Iritis was seen in 6 (20.68%) eyes it was mild in 4 cases while moderate to severe in 2 cases and was treated accordingly. In one case iritis was associated with massive hyphaema. Shallow anterior chamber was observed in 5 (17.24%) eyes. It was seen from very first day but disappeared within 2 - 3 days.

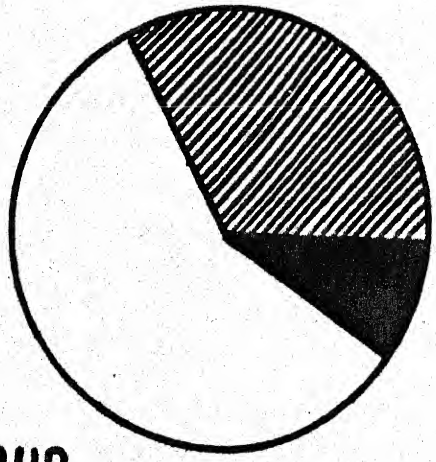
Visual prognosis :

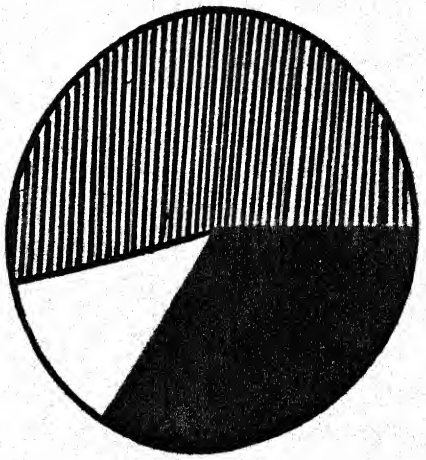
After 6 weeks of follow up aphakic correction was done with the help of spectacles. The corrected visual acuity is given in table no. 13.

Table no. 12

(Corrected visual acuity in relation to duration of acute attack & pre-operative visual acuity in 29 eyes)

Duration of attack days	Total no. of eyes	Pre-operative visual acuity	Final visual acuity 6/12 or better	6/24-6/18	6/60-6/36	6/60 or less	H.M.	No PL
Group - A								
∠ 2 days	5	Accurate PL PR - 5	2 (40%)	1 (20%)	-	2 (40%)	-	-
		Inaccurate PL PR-0	-	-	-	-	-	-
3-5 days	7	Accurate PL PR - 6	1 (14.28%)	3	1	1	-	-
		Inaccurate PL PR-1	-	-	-	-	1	-
Group - B								
6-10 days	6	Accurate PL PR - 5	-	1	2	2	-	-
		Inaccurate PL PR-1	-	-	1	-	-	-
11-20 days	4	Accurate PL PR - 4	-	1	1	2	-	-
		Inaccurate PL PR-0	-	-	-	-	-	-
7 20 days	7	Accurate PL PR - 0	-	-	-	-	-	-
		Inaccurate PL PR-7	-	-	-	1	5	1
Total	29	Accurate PL PR -20 Inaccurate PL PR-9	3	6	5	8	6	1





GROUP

VISUAL PROGNOSIS

A

B

GOOD 58·33% 11·76%

MODERATE 33·33% 52·94%

POOR 8·34% 35·30%

GRAPH REPRESENTING THE VISUAL PROGNOSIS IN GROUP A & B

Table no. 15

(Post-operative visual prognosis in relation to pre-operative intraocular pressure in 29 eyes)

Duration of attack	No. of eye	Mean intraocular pressure mm / mg	SD	Visual prognosis 5/12 to 6/9	6/18 to 6/24	6/36 to 6/60	6/60 to ⟨6/60	H.M.	NO PL
Group - A.									
⟨ 2 days	5	35.5 ±	12.33	2	1	-	2	-	-
3 - 5 days	7	46.0 ±	8.96	1	3	1	1	1	-
Group - B									
6 - 10 days	6	32.66±	9.64	-	1	3	2	-	-
11 - 20 days	4	45.05±	6.40	-	1	1	2	-	-
7 20 days	7	50.67±	6.93	-	-	-	1	5	1

DISCUSSION

DISCUSSION

Lens induced glaucoma is a condition to reckon within our ophthalmic patients from this part of the Country. The condition seems to be fairly common in our neighbouring districts. This may be due to the poor helth, education, lower socio - economic status illiteracy, poor geriatic care, fear of operation and inaccessability to ophthalmic surgeon by these patients.

This condition is acute in onset violent in its course, clinically recognisable easily treatable and also preventable.

This present study have been undertaken with the view of observing symptoms signs, effect of medic and surgical intervention, that is improvement in the visual acuity after operation in the cases of lens induced glaucoma.

This series consisted of 36 patients of lens induced glaucoma, out of which 29 eyes were subjected to surgery for glaucoma as well as lens extraction, and followed up for fulb period. Seven eyes operated only for glaucoma.

Incidence :

In present study the incidence of lens induced glaucoma in relation to the total cataract operated in this institution during one year period is 10.6%.

Table - 1

The incidence of lens induced glaucoma in present and other previous studies.

Sl. No.	Study	Total no.of cataract operation	No. of cases of lens induced glaucoma	percentage
1.	Jain et al (1962)	2719	108	3.91
2.	Dhar et al (1984)	6294	214	3.40
3.	Present study	339	36	10.6

The incidence in present study is much higher in comparison to the incidence of various workers, because the cases are smaller in number, people in this region are illiterate, very poor, does not know the meaning of health and living in the villages.

Age and sex :

The age of the patient varried from 35 to 80 years, with the M ± SD = 55.7 ± 12.46 years which is similar to previous studies (Jain et al 1962, Dhar et al 1984).

The patients included in this study were more female with a ratio of 1.12 female : 1.0 male, which is coinciding with those given in literature.

Table - 2

Age and sex incidence in present study and other privious studies

Sl. No.	Study	Average age (yrs)	Total no.of cases studies	No. of male patient (%)	No. of female patient (%)
1.	Flenk's et al (1955)	70	138	82 (59.43)	56 (40.57)
2.	Jain et al (1982)	62	86	40 (46.57)	46 (53.49)
3.	Dhar et al (1984)	65.5	214	93 (43.46)	121 (56.64)
4.	Present study	55.7	36	17 (47.22)	19 (52.78)

Maximum patients 66.66% belong to the rural and sub-urban area and only 33.33% came from urban area, indicate that this disease is much more common in villagers, which is comparable with other studies (Dhar et al 1984). We further observed that 34 (94.45%) patients belong to lower and lower middle class, who are unable to consult a specialist surgeon for their problem, and does not know that "prevention is better than cure".

Clinical feature :

The symptoms present in these cases given in observation table no. 4 are diminution of vision, eyeache, redness of eye, headache, nausea, vomiting, swelling of the lid and watering of eye are more a less similar to given in previous studies, Flock et al (1955), Jain et al (1982) and Dhar et al (1984).

In this study only 12 (41.37%) patients came within a week period of acute onset of disease and rest 17 (58.62) came after a week period. Out of which 7 patients came after a month duration, which is a very detrimental factor in the visual prognosis.

The signs which are found on examination enumerated in observation table no. 5 are circumciliary congestion, dilated pupil and shallow angerior chamber were found in 100% cases intraocular pressure was raised in 35 (97.21%) eyes. In one (2.78%) case intraocular pressure was low inspite of shallow anterior chamber pupillary block and circum ciliary congestion.

The cause of this lowering of intraocular pressure may be the cyclitis, Duke Elder et al (1966). Deffective vision were found in all the 36 cases, out of which

29 eyes these are operated for both lens extraction and glaucoma 20 (68.97%) eyes have accurate projection while 9 (31.03%) eyes have inaccurate projection.

The iritis is present in 11 cases. Six cases are observed by gonioscope and found that angle is open in all six cases prove that in phacotopic glaucoma angle is open.

In 31 cases (86.11%) senile cataract and in 5 (13.89%) traumatic cataract was present. Out of 31 in 30 cases of senile cataract, the cataract was present in the form of hypermature, or mature from indicating that lens induced glaucoma mostly occur due to hypermaturation of cataract.

Type of lens induced glaucoma :

The commonest cause of lens induced glaucoma in this series is phacotopic glaucoma (involving 29 (80.55%) of cases, including phacolytic and phaco - anaphylactic glaucoma. The second commonest causes is phacomorphic glaucoma including glaucoma due to pupillary block associated with sheilen intumescent or hypermature cataract. Third cause is displacement (anteriorly) of lens as the result of trauma.

Therefore, the phacotoxic glaucoma due to hypermaturation of cataract is the main cause of lens induced glaucoma. In hypermature stage due to the capsular dehiscence the degenerated lens matter, expelled out into the anterior chamber resulting in the above consiquences.

Control of Intraocular pressure :

All the cases were pre-operatively put on acetazolamide. In 14 (48.26%) cases instill the pilocarpine or timolol and, oral glycerol were given in 7 cases alongwith above treatment. In 8 cases were tension was not controlled by above, intravenous mannitol was administered prior to lens extraction.

In 12 (41.37%) eyes patient become normotensive following sector iridectomy and lens extraction. While in 17 (58.62%) cases performed combind extraction (filtering operation + lens extraction).

Complications :

In this series of cases operated for lens induced glaucoma, some complications were seen during the operation. These were blood in the anterior chamber in 1 (3.44%) case. The literature had only a few reports

with the blood in the anterior chamber as operative complication. Dhar et al (1984) reported 7.4% case had blood in the anterior chamber.

In this study rupture of the lens capsule takes place in 2 (6.89%) cases because lens capsule become very then & fragile or some time already rupture present in the lens capsule. Dhar et al (1984) reported 4.20% rupture of lens capsule.

In two (6.89%) cases vitreous disturbances occur in the form of vitreous prolapse - vitreous disturbance had been quite a frequent occurence during lens extraction in these cases, as evident from report of Dhar et al (1984) found vitreous prolapse in 3.27% cases.

In this type of cases the iritis is the most common complication after surgery. In present study it occur in 6 (20.86%) cases. During extraction of lens the lens matter releases act as foreign body and provoke a antigen antibody reaction. Shallow anterior chamber was observed in 5 (17.24%) cases reformed by more than 3 days. In literature Dhar et al (1984) reported with delay in chamber formation by 3 - 5 days in 5.60% cases.

These observations are quite comparable to the previous reports. In one eye, however, during dislocated lens removal accidental injury to the iris took place.

Visual prognosis :

The visual acuity was ranging from doubtful perception of light to hand movement or better at pre-operative examination. Out of 29 (100%) eyes, only 20 (68.97%) eyes had an accurate projection however, rest of the eye 9 (31.03%) has inaccurate projection ranging from doubtful perception of light to perception of light. After operation, however useful visual acuity was found to be present in 22 (75.86%) eyes ranging from 6/60 to 6/12 or better with aphakic correction.

We observed that the eyes seem to be with stand raised intraocular pressure for longer period than expected.

40% of the eyes with less than 2 days duration of acute attack recovered 6/12 visual acuity whereas only 14.28% of the eyes recovered this visual acuity in which the duration of attack lasted 3 - 5 days. Thus as the duration of attack increases there is a progressive decline in the recovery of visual acuity and beyond 3

weeks only light perception or hand movement could be observed. Out of 9 cases with inaccurate projection of light one case obtained 6/36 vision having history of attack of 5 days, one eye had hand movement however in other 7 eyes with inaccurate projection presenting 3 weeks or more after the attack, 6 eyes could achieve only the hand movement or perception of light. Thus in a case of lens induced glaucoma, who present early, a good functional recovery can be expected despite an initial inaccurate projection of light.

If we categorise the visual prognosis as good 6/24 or better, moderate 6/60to 6/24 and poor HM to PL then results of visual prognosis of this series are shown in table no. 3.

Table - 3

Visual prognosis in present study & previous studies.

Sl. No.	Study	No.of cases	Good V.A. 6/24-3/12	Moderate 6/60-6/36	Poor HM to PL
1.	Jain et al (1982)	86	54 (62.8%)	20 (23.3%)	12 (13.4%)
2.	Dhar et al (1984)	214	169 (79.0%)	36 (16.8%)	09 (04.2%)
3.	Present study	29	09 (31.03%)	13 (44.82%)	07 (24.13%)

In the present study good visual acuity obtained in fewer number of cases in comparison to the previous studies because maximum patients came after long duration of acute attack.

Ophthalmoscopy :

Optic disc also showed changes which were significantly related to the duration of attack of glaucoma, upto 10 days of attack a large majority of optic disc retained good colour. When the attack lasted more than 3 weeks nearly all the eyes developed pallor or atrophy of the disc.

CONCLUSION

CONCLUSION

In the light of the present work and with a view of studies in the past from the literature the following can be concluded :

(1) Lens induced glaucoma affected usually after 5th decade of life and commonly between 51 - 60 years of age (M ± SD 55.7 ± 12.46 years of age).

(2) In present study the incidence of lens induced glaucoma in relation to total senile cataract operated in the same duration is 10.6%, much higher than previous studies. 3.91% because people in this region are very poor, ignorant about health, and illiterate, live in the village and this disease is much commoner in poor, villagers.

(3) If affected both the sexes, females out numbered the male with a ratio of 1.12 : 1.0.

(4) The important symptoms and signs of this disease are gross diminution of vision due to cataract and glaucomatous attack, redness of eye, eyeache, circumciliary congestion, raised intraocular pressure, shallow anterior chamber and dilated pupil.

(5) All the patients put on medical and surgical therapy. The tension was reduced temporarily by miotics and acetazolamide and then increased again. If the glaucoma is present and the pressure is under 30 mm. mg. do not hesitate to do a combined extraction because removal of the lens as Dr. Heath has stated brings relief in such cases.

(6) In present study the most commonest type of lens induced glaucoma is phacotoxic type (phacolytic and phacoanaphylectic) in 29 (80.55%) cases.

(7) The most common types of complications occur during and after surgery in these type of cases were hyphaema, rupture of the lens capsule, vitreous prolapse and iritis etc.

(8) Pre - operative rise of intraocular pressure, accuracy of light projection and final visual recovery were significantly related to the duration of the acute attack of glaucoma. A good functional recovery was obtained, if the attack lasted less than 3 weeks, beyond which only hand movement or perception of light could be recovered.

(9) The condition of disc is also depends upon the duration of acute attack of disease.

(10) The condition has by and large an excellent prognosis even in the apparently hopeless cases, if treated within a week of acute attack. Even in patient with the doubtful perception of light at admission good visual improvement did takes place after adequate treatment.

BIBLIOGRAPHY

BIBLIOGRAPHY

1. Agarwal, H.C.et al : Secondary glaucoma. Indian J Ophthal, 30 : 121 - 124, 1982.

2. Ballen, P H et al : Spontaneous rupture of the lens capsule. Am J Ophthal, 39 : 403 - 405, 1955.

3. Barkan, O : Glaucoma classification causes and surgical control. Am J Ophthal, 21 : 1099, 1938.

4. Becker, B and Ley,A P : Epinephrine and acetazolamide in the therapy of chronic glaucoma. Am J Ophthal, 45 : 639, 1958.

5. Becker B et al : Hyperosmotic agent in symposium on ocular therapy. Vol 3 I H leopold ed st louis, ev Mosby Co. p 42, 1968.

6. Boger, W P et al : Long term experience with the timolol ophthalmic solution in patient with open angle glaucoma. Am J Ophthal, 85 : 259, 1978.

7. Boger, W P et al : A double masked clinical trial comparing timolol ophthalmic solution and pilocarpine in the therapy of open angle glaucoma. Am J Ophthal, 86 : 818, 1978.

8. Bon, W H : M J Australia, 1 : 451, 1941.

9. Burkey, E L and Wood, A G : Lens extract : Its preparation and clinical use : Arch Ophthal, 6 : 458, 1931.

10. Burkey, E L : Experimental endophthalmitis phaco-anaphylactica in rabbit. Arch Ophthal, 12 : 536, 1934.

11. Burkey, E L and Manton, H C; Am J Ophthal, 19 : 782, 1936.

12. Calhaun and Hegler : Experience with the jose barraquer method of extracting a dislocated lens : Am J Ophthal, 50 : 701, 1960.

13. Carson, N A J et al : Arch, Child. 37 : 505, 1962.

14. Carson et al : Homocystinuria : J Pediat, 66 : 565, 1965.

15. Chace, C C : Ibid. 21 : 124, 1939.

16. Chace, R R : Ibid. 34; 425, 1945.

17. Chandler, P A : Problem in the diagnosis and treatment of lens induced uveitis and glaucoma : Arch Ophthal, 60 : 828, 1958.

18. Chandler, P A : Choice of treatment in dislocation of lens : Arch Ophthal, 7 : 765, 1964.

19. Clark, C C : Ibid, 21 : 124, 1939.

20. Courtney, R H : Endophthalmitis with secondary glaucoma accompanying absorption of the crystalline lens : Tr. Am Ophthal Soc, 40 : 355 - 369, 1942.

21. Curran, E J : A new operation for glaucoma envolving a new principle in the aetiology and treatment of chronic primary glaucoma : Arch Ophthal.49 : 131, 1920.

22. Daily, R.K : St Med J Egha Ala, 26 : 396, 1933.

23. Dhar, S L et al : Lens induced glaucoma, A clinical study : Indian J Ophthal, 32 : 456 - 459, 1984.

24. Dryden et al : Sclerocorneal Transfixation method : Am J Ophthal, 52 : 468, 1961.

25. Duke Elder, S, Perkins, E S : Diseases of the uveal tract : In system of ophthalmology.vol IX S Duke Elder ed, London Henry Kimpton, 1966.

26. Duke Elder : Diseases of the lens and vitreous glaucoma and hypotony, system of ophthalmology, vol XI London Henry Kimpton p 662 - 663, 1969.

27. Ehrlich.L H : Am J Ophthal, 29 : 1274, 1946.

28. Elkington, A R et al : Anterior dislocation of lens in homocystinuria : Br J Ophthal, 56 : 325, 1973.

29. Erich Seidel, V Graefes : Arch Ophthal, 102 : 415, 1920.

30. Flock's M et al : Phacolytic glaucoma, A clinico pathologic study of 130 cases of glaucoma associated with hypermature cataract : Arch Ophthal 54 : 37, 1955.

31. Garston, J B , Gordon, R.R, Hart, C C and Pollitt, R T : Unusual cases of homocystinuria : Br J Ophthal, 54 : 248, 1970.

32. Gartner Klin Mbl Augenheilk : 133 : 31, 1958.

33. Gifford, H : Danger of the spontaneous cure of senile cataract : Am J Ophthal, 17 : 289 - 293, 1900.

34. Gifford, H : Glaucoma from absorption of senile cataract : Arch Ophthal, 1 : 83, 1918.

35. Gifford, H : The causes of glaucoma in hypermature cataract : Arch Ophthal, 56 : 457, 1927.

36. Goldberg, M F : Cytological diagnosis of phacolytic glaucoma utilising milipore filteration of the aqueous : Br J Ophthal, 51 : 847, 1967.

37. Gonzales, J et al : Spontaneous rupture of the morgagnian cataract : Am J Ophthal, 2 : 42, 1919.

38. Heath, P : Secondary glaucoma due to the lens : Arch Ophthal, 25 : 424,- 527, 1941.

39. Hegner : Beitr Augen heilk, 9, (90) : 707, 1915.

40. Hubersty, F S et al : Secondary glaucoma due to the spontaneous rupture of the lens capsule : Br J Ophthal, 37 : 432, 1953.

41. Irvine,S R and Irvine, A R : Lens induced uveitis and glaucoma III, Phacogentic glaucoma, lens induced glaucoma mature or hypermature cataract open iridocorneal angle : Am J Ophthal, 35 : 489, 1952.

42. Jain I S et al : Phacomorphic glaucoma management and visual prognosis; Indian J Ophthal, 31 : 648, 1982.

43. Jhanston, S S : Pupil block glaucoma in homocystinuria: Br J Ophthal, 52 : 251, 1968.

44. Kat'z, I M et al : Intraocular pressure decrease in normal volunteers following timolol ophthalmic solution: Invest Ophthal, 15 : 489, 1976.

45. Kaufman, S I : Morgagnian cataract and their complication: Arch Ophthal, 9 : 56 - 63, 1933.

46. Knapp, A : Glaucoma in morgagnian cataract : Arch Ophthal,56 : 124 - 127, 1927.

47. Knapp, H C : Spontaneous rupture of the lens capsule in hypermature cataract causing secondary glaucoma : Am J Ophthal, 20 : 820, 1937.

48. Krause, A C : Physiologic chemistry of the eye in Berens, C : The eye and its deseases philadelphia, W B Saunders Company, 13 : 116, 1952.

49. Levy and Anderson : Marchesani syndrome : Brt J Ophthal, 45 : 223, 1961.

50. Mc Donald and Purnell : The dislocated lens : J Am Med Ass, 145 : 220 - 226, 1951.

51. Marchesani O : Brachydactylie und angeborene kugellinse als systemer krankung klin Mbl Augen heilk ; 103 : 1392, 1939.

52. Nemitz Klin Mbl Augen heilk : 128 : 483, 1956.

53. Philips, C I : Howitt, G,Rowland, D J : Propranolol as ocular hypotensive agent : Br J Ophthal, 15 : 489, 1976.

54. Rahman, M : Br J Ophthal, 55 : 330, 1971.

55. Robert, M et al : Phacolytic glaucoma aggravated by hyphema that followed iridectomy : Arch Ophthal. 72 : 227, 1964.

56. Rodman : Chronic open angle glaucoma associated with traumatic dislocation of lens : Arch Ophthal, 69 : 465, 1963.

57. Rollet and Genet : Cataracte Laiteuse ouverte spontanement dans le chambre anterieure; Rev Gend Ophthal, 32 : 1 (Jan), 1913.

58. Rosenthal and Kloepfer : The spontaneous Brachy - morphic syndrome : Arch Ophthal, 55 : 28, 1956.

59. Safar, K : Cholesteral Extravasation in the anterior chamber and glaucoma: Ztscher F Augenh, 64 : 46, 1928.

60. Scott, J G : Br J Ophthal, 37 : 1, 58, 1953.

61. Segal: Oftalmologica (Bie), 6 : 207, 1962.

62. Smerel, S : Born Ved Praci Lek Tak Hradei Kralove, 5 : 93, 1962.

63. Smith, P : The pathology and treatment of glaucoma London J & A Churchill, 1891.

64. Smith, H : The treatment of cataract and some other common ocular affection, London Butterworth and Company Ltd , 1928.

65. Speath, G L and Barber, G W : Trans Am Acad Ophthal Otolaryng, 69 : 912, 1965.

66. Spaeth, G L and Barber C W : Homocystinuria, its ocular manifestation : J Pediat Ophthal, 3 : 42, 1966.

67. Srivastava, R N : To the study of health and water supply in rural area of Uttar Pradesh : Ind WHO Project, 1982.

68. Stepanik : Klin Mbl Augeheilk, 139 : 174, 1961 & 146 : 176, 1965.

69. Sugar, H S : Acute secondary glaucoma due to spontaneous rupture of lens capsule : Am J Ophthal 32 : 1509, 1512.

70. Saily, A : Spontaneous Aufsaugung linsr cotarectosan linse centralbl: F Parkt Augenh, 8 : 7, 1884.

71. Thomas,R P, Hollowel, J G et al : J Am Med Ass, 198 : 560, 1966.

72. Urbanek : Invers glaucoma, myotic precipitate an acute attack of raised tension : Augenheilk, 71 : 171, 1930.

73. Verhoeff, F H et al : Endophthalmitis phacoanaphy lactica International Cong. Ophthal. Philadelphia W.F. Fell Co, Am J Ophthal, 5 : 700 - 702, 1922.

74. Von Graefe, V : Graefes Arch Ophthal,15 : (21) : 153, 1869.

75. Von Reuss, A : Spontaneous Aufsaugung seniter stare in geschlossener K P sel Zentralbl F Parkt Augenh, 24 : 33, 1900.

76. Yamazi, S et al : Folia ophthal Jap, 28 : 739, 1977.

77. Zeeman W P C et al : Glaucoma phacogeneticum mit anatomischem befund ophthalmologica, 106 : 136 - 142, 1943.

78. Zimmerman, T J and Kaufman, H E : Timolol dose response and duration of action; Arch Ophthal, 95 : 605, 1977.

79. Zoldan Bull Oculist, 38 : 753, 1959.

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APPENDIX

APPENDIX - I

DEPARTMENT OF OPHTHALMOLOGY, M.L.B. MEDICAL COLLEGE AND HOSPITAL, JHANSI (U.P.)

PROFORMA FOR CASE EXAMINATION

Case No.

Name of the Patient :
Age / Sex :
Ward/Bed :
Address :
Occupation :

MRD NO.
DOA
DOD
(Improved/Death/Lamma/
Absconded/Non Improved

Chief complaints — Duration

1.
2.
3.
4.
5.

History of present illness — Duration

1. H/o diminution of vision
2. H/o Pain
3. H/o Redness
4. H/o Headache

Past History — Duration

1. H/o Ocular trauma
2. H/o glaucoma
3. H/o Nausea/Vomiting
4. H/o Diabetes Mellitus

EXAMINATION

General examination

- Pulse
- Blood pressure
- Temperature
- Hydration
- Cardiovascular examination
- Respiratory examination

Local examination of eye

Face Bilateral — Symetrical/Asymetrical
Orbit — Normal/Shrunken/Proptosed
Lid — Normal/Entropion/ectropion
Congestion — Conjunctival/Circumciliary/ Both

Cornea		Normal/Hazy
Anterior chamber		Normal/Shallow/Deep/Contents/blood/clear fluid/ Turbid fluid
	Aqueous flair	Present/Non present
Iris	Appearance	Normal/Atrophied/Coloboma/Muddy
	Synechia	Present/Non present
Pupil	Shape	Round/Oval/Irregular
	Size	Normal/Constricted/Dilated
	Pupillary reaction	Normal/Diminished/Absent
Lens	Position	Normal/Subluxated/Dislocated
	Appearance	Intumescent/Mature/Hypermature Calcification present/Not present

Visual Acuity

Hand movement	Present/Not present
PL	Present/Not present
PR	Present/Doubtful

Other eye - Normal/Imature cataract/Mature/Hypermature cat. Aphakic

Investigations

Tension - (Digital) Normal / Raised

Schiotz tonometry R eye ... mm Hg
L eye ... mm Hg

Slit lamp examination - Aqueous flair/present/non present Kp's present/Not present Indo-corneal angle open/closed grade 0,1,2,3,4.

Goniosceny

Urine - Albumin
- Sugar

Medical Treatment

Local-

Systemic-

Surgical treatment

Post Operative complication

Follow up - Fundus examination -
Tension - 15th day.....mm Hg 3 month....mm Hg
Aphakic Correction -

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